Easy III System Configuration

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Easy III - Client Computer Hardware Specifications

	Easy III XP/Server 2003	Easy III Windows 7/Server 2008
Operating System	32-bit Windows XP Professional, SP2 32-bit Windows Server 2003, SP2	64-bit Windows 7 Professional Windows Server 2008 R2
Processor	Dual Core, 2.13 GHz or faster	Dual Core, 3.2 GHz or faster (recommend i7 or Quad Core) Sentinel requires Quad Core minimum.
Hard Disk Drive	160 GB, NTFS file system, (Recommend 750 GB if the system is used for long term epilepsy monitoring or if several weeks of data storage is required.)	160 GB, NTFS file system, (Recommend 750 GB if the system is used for long term epilepsy monitoring or if several weeks of data storage is required.)
Memory (RAM)	4 GB	8 GB+
Archive Device	Recordable DVD+R/+RW and CD-RW Drive.	Recordable DVD+R/+RW and CD-RW Drive.
USB	USB 2.0 (2 port minimum)	USB 2.0 (2 port minimum)
Graphics	1600 x 1200, 256 MB, optional dual monitor output	1600 x 1200, 256 MB, optional dual monitor output
Network Card	10 Base-T Ethernet card required for connection to amplifier. A second network card is required for connection to a LAN, or IP based camera.	10 Base-T Ethernet card required for connection to amplifier. A second network card is required for connection to a LAN, or IP based camera.

Client Computer Platforms used by Cadwell[1]

- **Dell Optiplex 780** - Core 2 Quad, 2.66 GHz, 4 GB RAM, 500 GB Hard Drive, Dual monitor-256 MB graphics card, additional low profile network card.
- **Dell Precision T3500** – Core 2 Quad, 2.88 GHz, 4 GB RAM, 1 TB Hard Drive, Dual monitor-256 MB graphics card, additional network card.
- **Monitors**– Dell (P2411H) 24" Widescreen Flat Panel LCD 1920 x 1080 can be used with all Easy III systems. Dell (P2211H) 21.5" Widescreen Flat Panel LCD 1920 x 1080, used with all of our systems except Easy III PSG (Sleep).
- **Dell Latitude E6510 Laptop** - Core 2 Duo, i7-620M 2.66 GHz, 4 GB RAM, 250 GB Hard Drive, 15.6" display at 1920 x 1080.
- **Toshiba Tecra A11** - Core i7, 2.66 GHz, 4 GB RAM, 320 GB Hard Drive, 15.6" display at 1600 x 900.

Easy III Office Server Utility

- This utility is used to synchronize settings and data file location across all systems.
- The Office Server must be running at all times.
- The Office Server should be configured on a server in a data center, if available. It could also be configured on an XP or Windows 7 computer if the first option is not available.
- **Data does not have to reside on this system**. The utility is designed to synchronize data, **not store data.**
- The Easy III EEG systems should be in a workgroup or a part of the same domain.
- Easy III software must be installed on the local C: drive
- This utility can be installed on a virtual machine on the server, following are the minimum specs required for this utility: 4 GB RAM, 80 GB HD, Core2 duo (recommend i7 or Quad Core) CPU.

[1] Computer specifications and requirements are subject to change. Always contact Cadwell prior to purchasing computer hardware for your facility. The computers listed in this section are presently sold with Cadwell systems.

Data File Size: In order to calculate file size, multiply the MB/hr number that correlates to your study type, by the number of hours of total recording:

Easy III Data File Size Table (waveform data & video data)

Assuming Sony Camera, Dazzle adapter, lights on, low light checked.	Video Quality Setting	File Size (MB/hour) Video @ 30 fps[2]	File Size Waveform only (MB/hour)
Easy III Amplifier 32 EEG + 8 DC	Good	150 MB/hr	77 MB/hr

[2] Files sizes may be smaller or larger depending on specific video settings and environmental conditions (lighting, frequency of movement in video picture)

Importance of good network speed: Easy III can be successfully configured in a multi-hospital setting. The application is designed to allow users to review data from home, coffee shop, office, lab, and anywhere an internet connection can be made. Of course, it is important to note that data being read over a network is as efficient as its weakest connection. It is important that your configuration suits your networking infrastructure. Below is a bandwidth profile which provides an overview of the network speed required to accomplish tasks efficiently within the Easy III application. Cadwell recommends a 1GB connection where available. The important connection is the network from the system reading the data and the system that the data resides on at that time.

Easy III Network Bandwidth Profile

	Average Downstream Data Transfer	Average Upstream Data Transfer
Remote file viewing/reading/video playback from a network folder	685 KB/s	90 KB/s
Live monitoring with streaming video webpage from Sony IP camera	2.47 mbps	114.8 kbps
Live monitoring with streaming video webpage from Sony IP camera with concurrent video playback from previously recorded data	5.15 mbps	180 kbps
Live monitoring with NO streaming video with concurrent video playback from previously recorded data	3.32 mbps	137.2 kbps

Outside Hospital Connections

There are a few ways to remote in and view live or recorded data from outside the hospital network. The preferred method is via a Citrix portal, Easy III can be published on Citrix and works well in that environment. Other alternatives include utilizing a VPN into the hospital if the IT department already has a process for this established and will allow the appropriate staff access via VPN or setting up a Terminal Server. The customer is responsible for all the outside connections. In the case of the VPN, Cadwell recommends that all the data remain at the hospital. The outside computer can read the data as if they were on the network inside the hospital.

Outside/Inside Hospital Connections Using a Citrix Server

Cadwell has many customers using Citrix. Though our software can be configured with Citrix, you may need to contact your Citrix provider if direct Citrix support and assistance is required.

Specifications for Citrix Server:

- This application can be installed on a virtual machine on the server, following are the minimum specs required for this application: Server 2008 R2 or 32-bit Server 2003, 4 GB RAM, 80 GB HD, Core2 duo (or equivalent) CPU.

Please note our comments below regarding Citrix:

- Cadwell Reading software can be published on the Citrix Server.
- The Citrix Server will require a C: drive to install the Easy 3 software on.
- The patient Data is stored on the network or on a dedicated Windows XP reader PC. In most cases the patient **data is not stored** on the Citrix server but somewhere on the network, which the users have access to when connecting through the Citrix Server.
- Anyone with the proper Citrix and Cadwell access rights can access the Citrix server and operate the Cadwell Review software from the remote PC.

Following are some configuration tips for setting up Easy III on the Citrix server:

- Make sure that legacy audio is enabled on the server side, if not enabled, video may not display correctly.
- For the published app, select High color 16 bit.
- If grey or blue screen is appearing, apply the hotfix patch to the Citrix server, http://support.microsoft.com/kb/955692/en-us
- If the audio is full of static on the client side, make sure that the audio policy is set to high on both the server and client.

Antivirus Software and Disk Encryption Software Applications

Cadwell encourages all customers to take necessary precautions to protect computer systems from malicious programs. We also want you to protect the privacy of your patient data. *Though Cadwell has configured Easy III software with multiple AV and disk encryption applications, we cannot verify compatibility with all applications available in the marketplace.*

1. Scheduled antivirus scans should not happen during a recording/data collection.
2. Exclude Easy III files from scans
    a. .ez3 (Easy III data file)
    b. .qv2 (video file)
    c. .mdh (archive history file)
    d. .ezvideo (video file)
    e. .ezvideoindex (video file)
3. Exclude the following folders from scans, including their subfolders
    a. C:\QMWorkstation
    b. C:\Cadwell\Easy III
    c. C:\QMOffice (this is only on the office server utility)
4. After loading any AV application or disk encryption, do the following:
    a. Attempt to open a data file, verify the file opens correctly
    b. Import a file through the Record Manger, verify it will import correctly
    c. Archive a file through the Record Manager, verify it will archive correctly
    d. If the system is a data collection system, start a recording, verify no conflicts appear
    e. Generate a report and confirm that the length of time to generate is unchanged.
5. Contact Cadwell if you would like to configure a test system. We will provide a temporary software license to allow you to test compatibility.
6. Verify that encryption software does not adversely delay file access and overall Easy III performance. Verify that Easy III records can be opened promptly and paging speed is adequate after installing encryption or AV software.
7. Microsoft Word is utilized during report generation, Word creates a .tmp file while generating the reports, if this file is scanned during report generation, that can increase report generation times.

Cadwell Easy III PSG Equipment Summary Sheet
Power and Cabling requirements and placement

Patient Room Equipment

Equipment	Location	Connection	Power
Cadwell Amp & Power Com	**Bedside, both devices can be wall mounted.**	**-Direct Cat5 connection to PC in Control Room (do not connect through switch)**	**Standard Power Outlet behind night stand or close to bedside**
Video Camera	**Ceiling mount in corner of room opposite the patient bed.**	**-Coaxial cable with BNC connector connected to PC in Control Room** **-Cat5/Cat6 Connection to Network Switch, if IP camera.**	**Standard Power Outlet in ceiling within 4' of camera**
IR Illuminator	**Wall Mountable in corner of room opposite the patient bed near camera**	**No connection to other equipment**	**Standard Power Outlet**
Speaker/Mic Box	**Bedside**	**-Intercom wire connection to Control Box which sits next to PC in Control Room**	**No Power Outlet required in Bedroom, Standard Power outlet in Control Room**
CPAP (not supplied by Cadwell)	**Bedside**	**-Most brands use direct Cat5 connection to PC in Control Room**	**2X Standard Power Outlets Req behind Night Stand or close to bedside**

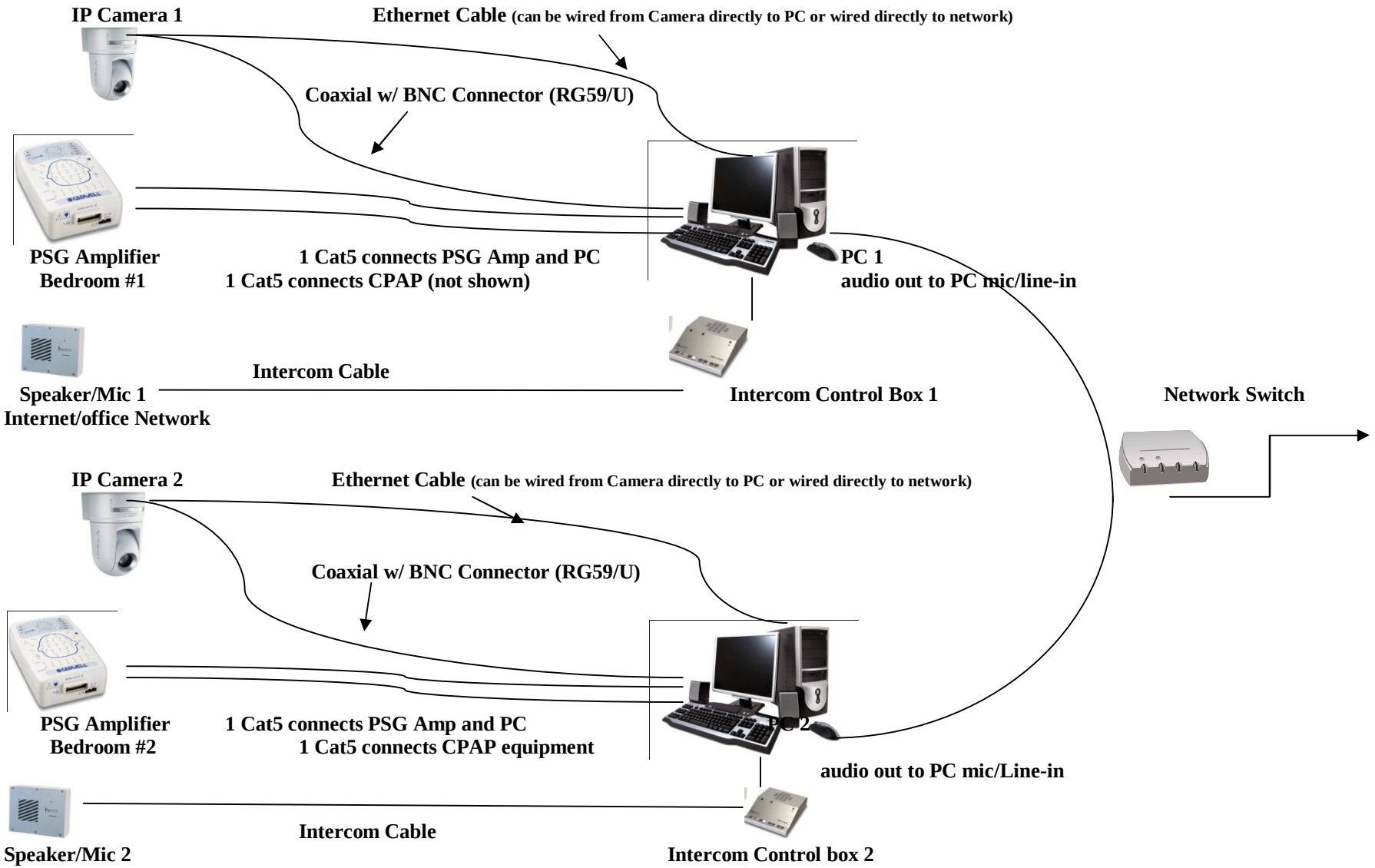
Control Room Equipment

Equipment	Location	Connection	Power
1 PC / Monitor per Patient Room	**On Desk accessible to Dr's and technician, usually one technician is required for every 2 patients so PC's can be set up in pairs**	**-Cat5/Cat6 connection to network switch** **-Cat5 connection to Cadwell Amp in Patient Room** **-Coaxial Connection to Video Camera in Patient Room** **-Cat5 Connection to CPAP in Patient Room**	**2X Standard Power Outlet, recommended surge protection and alternate power supply**
1 Intercom Control Box per Patient Room	**On Desk or mounted on Wall next to PC**	**-Connection – West Penn 356 or similar. Wire Description:** 4 Conductor with a drain wire consisting of 2 conductor shielded, 20 gauge with a 22 gauge drain wire (microphone connection) and 2 conductor twisted pair unshielded, 18 gauge (speaker connection) **Speaker/Mic Box in Patient Room** **-Audio Out Connection to PC in Control Room**	**Standard Power Outlet**

*Cat 6 cabling is preferred.

Cadwell Easy III PSG Lab Cabling Diagram – IP P/T/Z Camera (Example)

Note: 110V Outlets needed for Cameras, IR lights, Amplifiers, PC's and Intercom Control Box in close proximity to devices


IP Camera 1
Ethernet Cable (can be wired from Camera directly to PC or wired directly to network)
Coaxial w/ BNC Connector (RG59/U)
PSG Amplifier
Bedroom #1
1 Cat5 connects PSG Amp and PC
1 Cat5 connects CPAP (not shown)
PC 1
audio out to PC mic/line-in
Intercom Cable
Speaker/Mic 1
Internet/office Network
Intercom Control Box 1
Network Switch
IP Camera 2
Ethernet Cable (can be wired from Camera directly to PC or wired directly to network)
Coaxial w/ BNC Connector (RG59/U)
PSG Amplifier
Bedroom #2
1 Cat5 connects PSG Amp and PC
1 Cat5 connects CPAP equipment
PC 2
audio out to PC mic/Line-in
Intercom Cable
Speaker/Mic 2
Intercom Control box 2

Cadwell Easy III EEG Equipment Summary Sheet
Power and Cabling requirements and placement

Patient Room Equipment

Equipment	Location	Connection	Power
Cadwell Amp & Power Com	Beside bed, chair, or on a cart.	Direct Cat5 connection to PC from power/com	Standard Power Outlet beside bed/chair. For cart, plug into isolation transformer
Video Camera, if needed	Ceiling mount in corner of room opposite the patient bed or Wall mount with use of optional camera wall mount. If cart, mounted on bracket on cart.	If mounted to wall/ceiling: Coaxial cable with BNC connector connected to PC and Cat5/Cat6 Connection to Network Switch, if Sony IP camera.	Standard Power Outlet in ceiling within 4' of camera. For cart, plug into isolation transformer.
IR Illuminator, if needed.	Wall Mountable in corner of room opposite the patient bed near camera or on cart.	No connection to other equipment	Standard Power Outlet
Photic	-On mobile floor stand -mounted on arm on cart -next to patient bed/chair	Cable comes with photic, connects photic to power/com module	N/A
PC/Monitor (in this scenario, the PC is on a cart)	PC placed on lower shelf of cart, monitor mounts to bracket on cart.	Cat5/6 connection to power/com Cat5/6 to camera (if Sony IP) Cat5/6 to hospital network. If 3 NIC cards are not on board, the camera and hospital network can plug into a 5 port switch on cart.	Plug into isolation transformer.

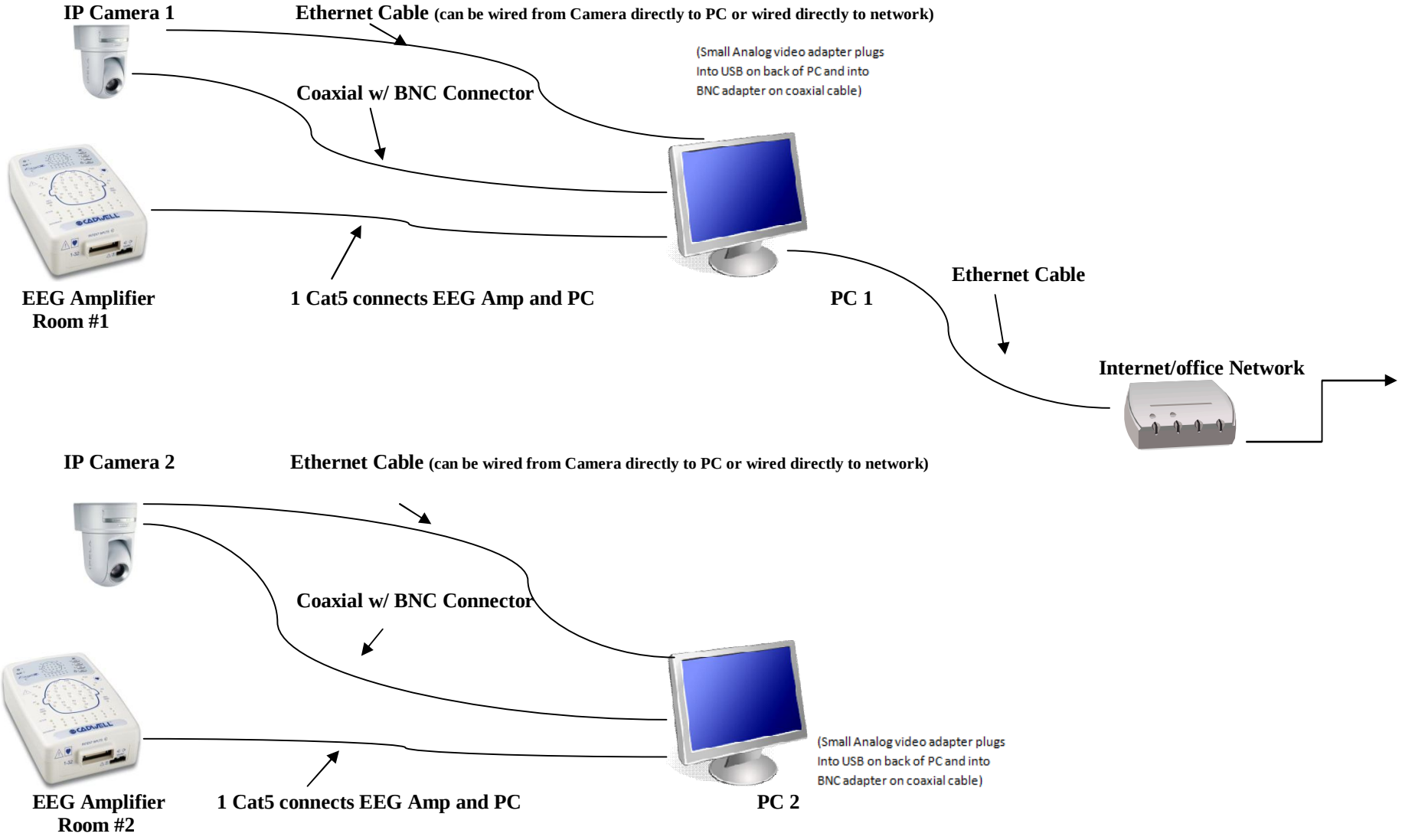
Control Room Equipment

Equipment	Location	Connection	Power
PC / Monitor	On Desk accessible to physicians and technicians.	Cat5/Cat6 connection to network switch	2X Standard Power Outlet, recommended surge protection and alternate power supply
Network Switch	Usually in Control Room close to PCs.	Cat5/Cat6 connections from IP Video Cameras in Patient Room Cat5/Cat6 connections from PCs in Control Room and patient room Cat5/Cat6 connection to office/hospital network or internet	Standard Power Outlet

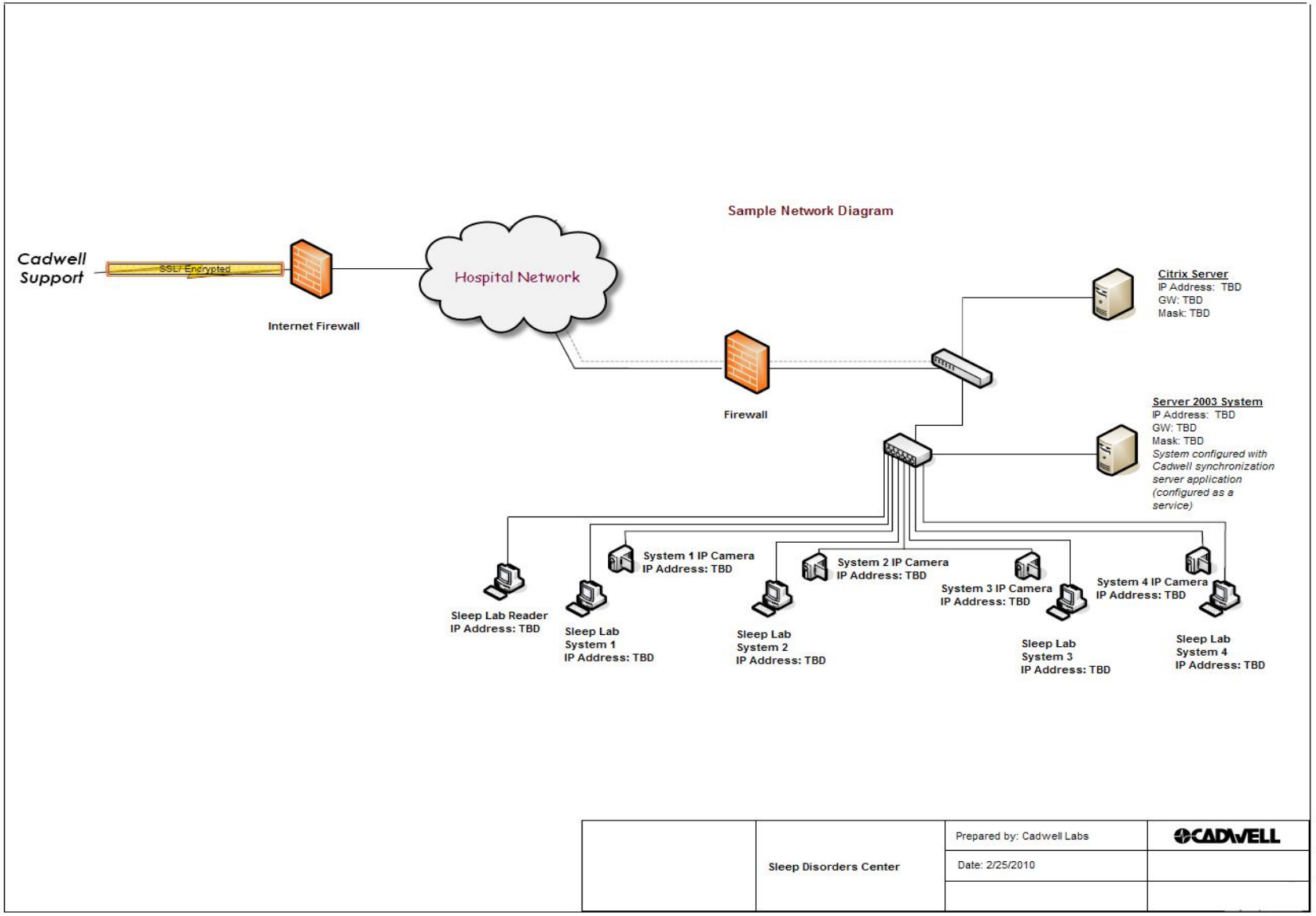
*Cat 6 cabling is preferred.

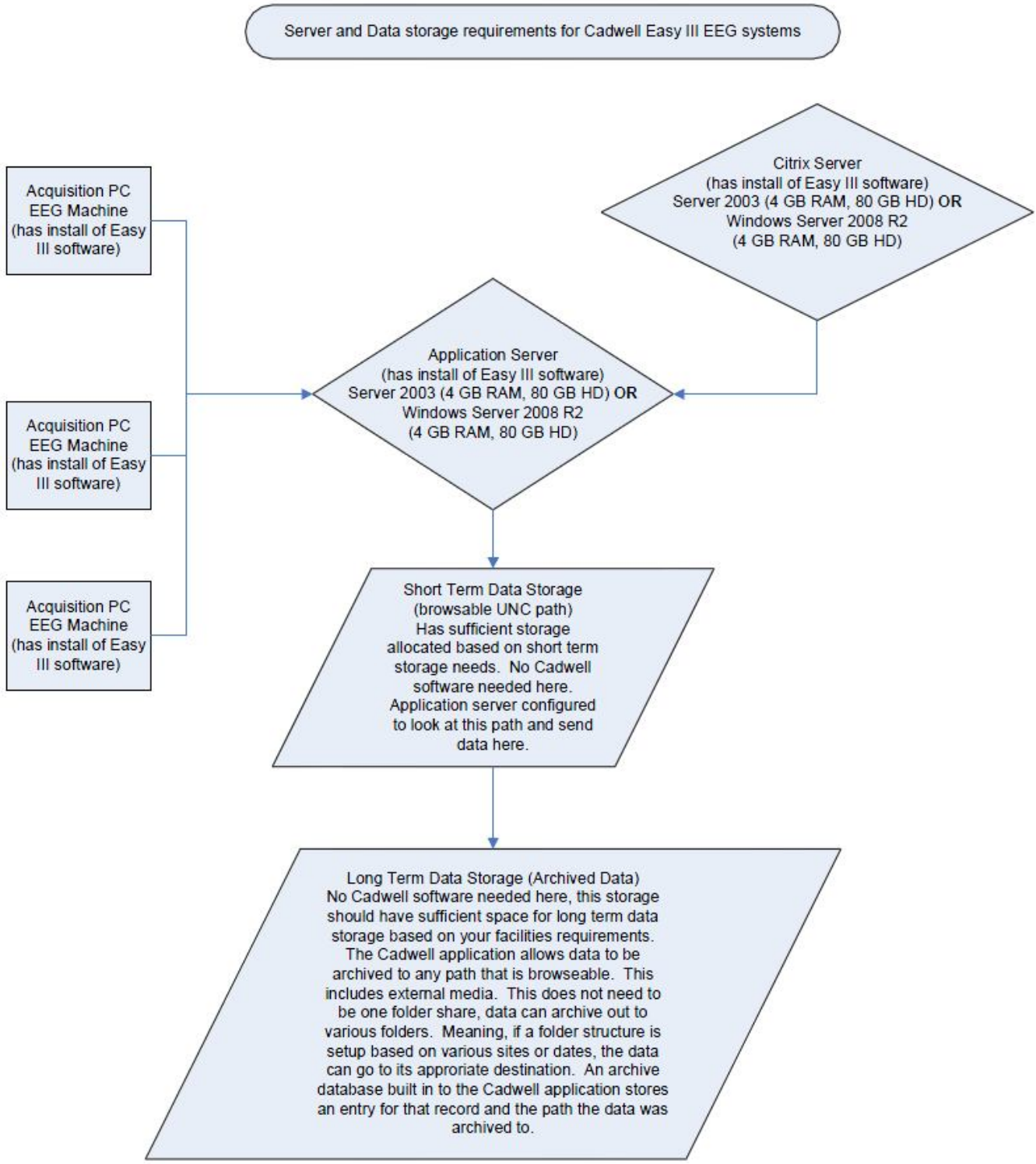
Cadwell Easy III EEG Lab Cabling Diagram – IP P/T/Z Camera

Note: 110V Outlets needed for Cameras, Amplifiers, and PC's close proximity to the devices


IP Camera 1
Ethernet Cable (can be wired from Camera directly to PC or wired directly to network)
(Small Analog video adapter plugs Into USB on back of PC and into BNC adapter on coaxial cable)
Coaxial w/ BNC Connector
EEG Amplifier Room #1
1 Cat5 connects EEG Amp and PC
PC 1
Ethernet Cable
Internet/office Network
IP Camera 2
Ethernet Cable (can be wired from Camera directly to PC or wired directly to network)
Coaxial w/ BNC Connector
EEG Amplifier Room #2
1 Cat5 connects EEG Amp and PC
PC 2
(Small Analog video adapter plugs Into USB on back of PC and into BNC adapter on coaxial cable)

Example of an ideal Easy III networked solution




Server and Data storage requirements for Cadwell Easy III EEG systems
Acquisition PC
EEG Machine
(has install of Easy
III software)
Acquisition PC
EEG Machine
(has install of Easy
III software)
Acquisition PC
EEG Machine
(has install of Easy
III software)
Citrix Server
(has install of Easy III software)
Server 2003 (4 GB RAM, 80 GB HD) OR
Windows Server 2008 R2
(4 GB RAM, 80 GB HD)
Application Server
(has install of Easy III software)
Server 2003 (4 GB RAM, 80 GB HD) OR
Windows Server 2008 R2
(4 GB RAM, 80 GB HD)
Short Term Data Storage
(browsable UNC path)
Has sufficient storage
allocated based on short term
storage needs. No Cadwell
software needed here.
Application server configured
to look at this path and send
data here.
Long Term Data Storage (Archived Data)
No Cadwell software needed here, this storage
should have sufficient space for long term data
storage based on your facilities requirements.
The Cadwell application allows data to be
archived to any path that is browseable. This
includes external media. This does not need to
be one folder share, data can archive out to
various folders. Meaning, if a folder structure is
setup based on various sites or dates, the data
can go to its approriate destination. An archive
database built in to the Cadwell application stores
an entry for that record and the path the data was
archived to.